

# **Response to Comments Document for Total Maximum Daily Load (TMDL) Development for the Little Calfpasture River**

## **Introduction**

A final public meeting was held for the Little Calfpasture River benthic TMDL on November 19, 2009. This project included a review of the three stressors contributing to the benthic impairment and a sediment TMDL for the Little Calfpasture River. The draft TMDL report (*Total Maximum Daily Load Development to address a Benthic Impairment in the Little Calfpasture River, Rockbridge County, Virginia*) was presented at the meeting and made available on the Virginia Department of Environmental Quality (DEQ) website at that time. A public comment period on the draft TMDL report was held from November 19 until December 18, 2009. During the public comment period comments were received from a number of stakeholders in the Little Calfpasture River and Maury River watersheds, including the Virginia Department of Conservation and Recreation (VADCR), the Rockbridge Area Conservation Council (RACC), the Friends of the Maury organization (Friends) and Southern Environmental Law Center (SELC), and Dr. Deva Borah, a professional engineer contracted to review the TMDL. The full text of the original comments and DEQ's responses to those comments are provided below.

## **Comments provided by Friends of the Maury and SELC (11/10/09)**

At the November 6 meeting, we gave you the draft review of the Draft TMDL by Dr. Deva Borah, Ph.D., P.E., who we retained to examine technical aspects of the draft and underlying modeling, and he participated in the meeting. His complete review and evaluation is attached. In his review, he found potential serious issues with the modeling of sediment pollution in the Little Calfpasture River. Fundamentally, he concluded that DEQ has "extrapolated and assumed information that they have substituted for hard data and then run it through an inappropriate modeling scheme." His comments continue to emphasize the need for sufficient data and proper modeling to ensure that the TMDL does not inaccurately characterize sediment inputs to the Little Calfpasture, the role of the Lake Merriweather in sediment transport, and the sediment transport downstream of Lake Merriweather. Because the entire TMDL is based on this model, we continue to believe the TMDL will be fatally flawed until the assumptions are corrected with actual data and appropriate modeling is performed, regardless of how much work is put into it.

We believe that the current draft simply is not grounded sufficiently in data and proper analysis to provide a meaningful map for restoring the Little Calfpasture. This is particularly true with respect to the polluting effects of Lake Merriweather. As the Draft TMDL points out, Lake Merriweather is one of the primary causes of the river's impairment, yet the TMDL does not contain sufficient data or analysis about the lake, flows out of the lake, or management of the dam to yield adequate information about the contribution of the lake to the impairment and how to mitigate that contribution.

*DEQ Response: Many claims in this comment section are addressed in detail in the response to Dr. Borah's Review and Evaluation document which follows this comment section.*

While we recognize the limits on DEQ's resources and time, this lake-caused sediment problem is unusual and warrants more than the typical level of data collection and analysis, in order to ensure that this TMDL's strategy can actually achieve the objective. If additional data collection and modeling cannot be performed before the TMDL is adopted, DEQ should begin collecting it and commit to using it to verify the model, reevaluate the TMDL and make any necessary adjustments.

*DEQ Response: TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and DO monitoring on the Little Calfpasture River and will also evaluate any data that become available from Lake Merriweather. If this monitoring and data evaluation reflect a need for modification of the TMDL, DEQ will address the need.*

We also want to reiterate our concern that this TMDL only aims to meet the lower water quality standard recently adopted for the Little Calfpasture below the Goshen Dam through the UAA/special standard process. Even if this lower standard is met, the river will remain "severely impaired" by normal water quality measurements, yet DEQ never thoroughly evaluated alternatives for attaining the current designated use and did not appropriately determine the next highest attainable use. We previously sent you a copy of a letter to the EPA that further describes these objections to the UAA.

*DEQ Response: DEQ disagrees with the statement that "this TMDL only aims to meet the lower water quality standard recently adopted for the Little Calfpasture below the Goshen Dam." The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards, but DEQ will defer to EPA's decision on the matter. Note: As of 12/29/2009, the Little Calfpasture UAA was approved by EPA.*

#### 1. Full Explanation of Sedimentation Problem Caused by Lake

First, although the Draft TMDL notes that "the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam," (p.1) it does not clearly explain in one place: (1) the details of the sedimentation problem caused by the lake or (2) how reducing sediment levels upstream of the dam will resolve the lake-caused problems below the dam. In the Executive Summary and in the discussion of sediment as a "most probable stressor" on page 59, the Draft TMDL should clearly explain the sedimentation problem caused by the lake. For example, it is our understanding that, during storm events, the lake extends the duration of high sediment levels and existing sediment on the lake bed is re-suspended. Erosion from shoreline exposed by temporarily lowering the

lake during storm events is also a cause of sediment input to the lake and river. The effects of these extended high sediment levels are exacerbated by relatively low flows in the river below the dam, which allow sediment to build up in the Little Calfpasture, rather than being flushed downstream. Although most of this information can be found at various points in the Draft TMDL, the draft should more clearly lay out what is presently known about the extent and manner of the lake's contribution to downstream sediment pollution.

*DEQ Response: This comment was addressed in the draft TMDL document released on November 19. Changes were made to the Executive Summary and Section 4.5.2 to better reflect and explain the cause of the sedimentation.*

The Draft TMDL should further explain how it will resolve these sediment problems. The report proposes to reduce upstream sediment but does not explain how this would solve the lake-caused problems of extended duration of sediment discharge or recirculation of existing sediment – both of which harm aquatic life. This is a major gap. It is also not clear how the frequency of high-sediment events in the various scenarios is an adequate substitute for the duration of each event. The “Future Goals” section of the report on page 4 only asserts that “[if] these reductions are made, sediment loads will be reduced to below the 2001 levels...and aquatic life should be restored.”

*DEQ Response: The comment suggests that the TMDL will target only areas upstream of the lake for sediment reduction. That is not correct. The TMDL proposes sediment reductions and identifies needed reduction percentages from the lake and its boundaries and from upstream sources. The specific recommended actions will be identified in the TMDL implementation plan. These issues are explained in more detail in Sections 7.1.2 (pg. 134) and Section 7.3 (pg. 142) of the TMDL document.*

## 2. Analysis of Dam and Lake Management Techniques

To redress lake-caused sedimentation, the Draft TMDL should analyze options for changing dam and lake management to reduce sediment pollution downstream and to help flush sediment in the Little Calfpasture. The TMDL does not explore various lake management strategies and their feasibility, such as avoiding the release of water too far in advance of storm events to minimize the exposure of bare shoreline, or increasing water releases after storm events to mimic natural storm and flow patterns and allow sediment to be flushed downstream. Another possible approach may be to lower the lake permanently by several feet and to plant vegetation along the exposed shoreline, reducing shoreline erosion and potentially removing the need to draw down the lake before storm events.

The feasibility of these and other options, the dam's current configuration, the possibility of refitting the dam, and the possible effects of such management changes all need to be explored in the TMDL. We understand that DEQ may consider these approaches to be more appropriately addressed in any subsequent implementation plan, but a study of these issues is needed to assess the pollution reductions that can be achieved by various sources and to budget those reductions among the sources.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources that meet water quality standards. The way in which individual sources or landowners meet those established reductions is not intended to be addressed in the TMDL. This approach provides flexibility in meeting the TMDL during implementation planning. The TMDL does, however, consider different combinations of reduction levels among the various sources. Several alternative allocation scenarios were included in the Allocation Scenarios in Section 7.4 (pg. 143) of the draft TMDL document.*

Resolving the lake-caused sediment problem should be inserted into the “Future Goals” section of the report after the goal of reducing upstream sediment, and individual techniques should be discussed in the “Proposed Plan to Address the Water Quality Impairment” (p.72) or Implementation section.

*DEQ Response: The TMDL draft was revised to reflect this comment, especially in Sections 1.4 (pg. 6), and 4.7.3 (pg. 76).*

### 3. Better Information and Dam Operation Records

Importantly, DEQ should also revise the Draft TMDL to include more information on dam operation and to address the need for more comprehensive records. Better records of dam operation, such as when and how much water is released relative to storm events, are essential to the TMDL to determine what flow is required to flush sediment downstream and to further calibrate the model. The current draft lacks sufficient records on the dam’s operation, stating merely that “[t]he gates were returned to the full pool position on March 8, 2007. To VADEQ’s knowledge, the gates have not been lowered for extended periods of time since March 2007” (p.14). This is troubling in light of the history of non-compliance with consent orders regarding dam operation (see pp.12-14) and considering that “there is still the periodic need to lower lake levels during flood events and for maintenance” (p.59). The TMDL should include more information on dam operation (if available) and address the need for better records in the future in its discussion of the implementation plan on page 6 and in its “TMDL Implementation and Reasonable Assurance” section beginning on page 155. If DEQ and the National Capital Area Council do not start collecting better data now, we will continue to be in the dark as to these critical issues when the time comes to start work on an implementation plan. As mentioned above, Dr. Borah identified a number of needs for additional information regarding the Little Calfpasture and Lake Merriweather. While this data should be gathered and considered before the TMDL is adopted, if that is impossible we request that DEQ begin gathering it right away and commit to using it to properly calibrate and verify the model used to develop the TMDL and to reevaluate the TMDL to assess whether it is on the right track or adjustments are needed.

*DEQ Response: DEQ’s Enforcement Program is committed to monitoring compliance with the Consent Order. The TMDL model is fully integrated with the available dam operation data. Any further issues and resulting data will be included in a modification of the TMDL.*

#### 4. “No-Lake” Scenario Analysis

The Draft TMDL should also analyze a “no-lake” scenario, rather than simply stating that removal of the dam “is not feasible at the present time” (p.72). As the DEQ has not studied whether dam removal is feasible, it should further remove the phrase “not feasible” from the report because it lacks proper support. A no-lake option is vital to presenting all options and providing a basis for comparison, because the report acknowledges that removal of the lake could eliminate the impairment, “since the ultimate source of [the] three stressors is the Goshen Dam” (p.72) and states that, even if other causes are eliminated, some level of impairment will continue “for some distance downstream of Lake Merriweather” so long as the river is impounded (p.68).

*DEQ Response: The TMDL was revised to accommodate this comment. All references to “feasible” options were eliminated from the draft report. A detailed “no-lake” scenario was included in the allocation scenario analysis in Section 7.4 (pg. 143).*

#### 5. More Specific Implementation Plan Recommendations

The “What Happens Next” section of the Executive Summary and the Implementation Plan section would be strengthened by including more-specific recommendations for the Implementation Plan. These should address lake management options, such as increasing flows below the dam periodically to flush sediment, and should include additional steps aimed at reducing sediment levels, such as requiring future ground-disturbing activities in the watershed of this impaired river to use mitigation measures greater than standard BMPs.

*DEQ Response: The goal of a TMDL is to create a “pollution budget” for a stream – that is, it sets limits on the amount of pollution that a stream can tolerate and still maintain water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

#### 6. Role of Algae in Dissolved Oxygen Analysis

The proposed Draft TMDL should further address the possible role of algae in the low dissolved oxygen (DO) below the dam. The draft discusses algae briefly in its DO section on pages 36-37 and explains that dissolved oxygen is lower at night when algae are unable to photosynthesize, but treats this as normal. This is a sign of an algae-driven cycle; without algae in control, oxygen levels should be higher at night because colder water holds more oxygen.

*DEQ Response: Colder water does hold more oxygen, but in fact, the DO curve found in the Little Calfpasture River demonstrates the normal range for a stream, with the exception of the ultra-low diurnal levels during Summer months. The idea that dissolved oxygen would be higher at night discounts the influence of algae, which produces oxygen using sunlight. This influence is more productive and donates more oxygen to the system than the higher capacity of colder water temperature could contribute. DO monitoring*

*by DEQ staff during the summer of 2009 showed a dramatic improvement and no water quality violations; however, yearly monitoring will continue to ensure that this continues.*

**Comments provided by Dr. Deva Borah, Woolpert (11/10/09)**

Data used to calibrate the LSPC model on the Little Calfpasture River watershed was not adequate. As suggested by USEPA (Shoemaker et al., 2005) and reviewed by Borah et al. (2006), LSPC is mostly an empirical watershed simulation model based on the HSPF model, parameters of which need extensive calibration using observed data.

*DEQ Response: DEQ disagrees and asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

The hydrologic parameters were projected from nearby watersheds where the parameters were calibrated earlier using a larger Chesapeake Bay Model (CBM) during the USEPA's Chesapeake Bay water quality improvement investigations. The projected parameter values are good initial numbers to start the model although do not necessarily represent the Little Calfpasture River watershed because hydrological sensitive factors (soil, land use, and topography) are not exactly the same (non homogeneous) as the watersheds from where the parameters were derived. Observed flow data are needed to adjust the parameter values and match the conditions of the Little Calfpasture River watershed.

*DEQ Response: Due to resource constraints, it is not always possible to have gaged flow data for every watershed under TMDL development. For this reason, it is common practice in TMDL development to use calibrated watershed parameters from a similar nearby gaged watershed. This practice has been used in numerous EPA-approved TMDLs including the following: Hays and Moffatts Creeks in Rockbridge County, Hawksbill Creek in Page County, Mill Creek in Page County, Naked Creek in Augusta County, Holmans Creek in Shenandoah County, to name a few. For the Little Calfpasture River TMDL, DEQ improved upon this methodology by using calibrated hydrologic parameters from the Chesapeake Bay model. This meant that hydrologic parameters were calibrated for the actual watershed, just at a larger spatial scale. The Chesapeake Bay Model derived hydrologic parameters for western Augusta County and Rockbridge County from calibration to multiple gaging stations that receive flow from these areas (including the Calfpasture River, Maury River, Middle River, as well as others). Lastly, the modeled flow in the Little Calfpasture River was tested by adding it to the Calfpasture flow and comparing against the downstream gaged flow in the Maury River. This comparison revealed very good agreement.*

Area averaged flow of the Little Calfpasture River (83 mi<sup>2</sup>) derived from the Maury River Gage (329 mi<sup>2</sup>) is not representative of the Little Calfpasture River for verification of model results because of non-homogeneity of hydrologic characteristics and more importantly presence of the Lake Merriweather within the Little Calfpasture River

watershed. It is a fact that storage system such as Lake Merriweather reduces storm peak flows and increases and prolongs flows during the recession portion of a hydrograph. These effects from Lake Merriweather are negligible on Maury River flows during storm events because the lake drains only one quarter of the Maury River basin. Therefore, area proportioned flows from the Maury River do not carry Lake Merriweather influences and are not appropriate to verify simulated flows from Little Calfpasture River.

*DEQ Response: After original comments from Dr. Borah in October, the flow comparison was revised such that an area-weighted flow method was no longer used for the Little Calfpasture River. The flow comparison was revised to compare modeled Little Calfpasture River flow plus gaged Calfpasture River flow to gaged Maury River flow. A discussion of this comparison can be found in Section 6.5.1 (pg. 116) of the final report.*

Similarly, calibration of LSPC sediment parameters without adequate sediment measurement is unacceptable in scientific investigations. Projected parameter values from CBM must be adjusted for Little Calfpasture conditions. Annual target sediment estimates from RUSLE could have wide variations and are not representative of existing conditions during storm events. The “observed sediment rating curves” referred in Sieber (personal communication, October 5, 2009) and shown in Figures 6-17 (Brent, 2009) are not actually observed sediment rating curves. Observed TSS values are plotted against model simulated flows and such curves are not appropriate to calibrate or validate model. Sediment flux comparisons shown in Figure 6-18 based on such a curve are invalid.

*DEQ Response: DEQ used EPA’s guidance (USEPA, 2006. EPA BASINS Technical Note 8: Sediment Parameter and Calibration Guidance for HSPF) as well as guidance developed by Donigian and Love (Donigian and Love, 2003. Sediment Calibration Procedures and Guidelines for Watershed Modeling) to calibrate sediment parameters in the Little Calfpasture River model.*

Sediment data used to calibrate the model is too sporadic. As documented in the literature (Borah et al., 2003), suspended sediment concentration vary significantly during a storm event. Most of the annual sediment is generated and transported during those few storm events. As shown in Figures 6-19 through 6-22 (Brent, 2009), the model even failed to predict the limited observed TSS concentrations.

*DEQ Response: DEQ disagrees and asserts that adequate sediment data were used to calibrate the Little Calfpasture sediment model. The model was calibrated against more than 80 suspended sediment samples collected during the calibration period. After original comments from Dr. Borah in October, DEQ added to the report an analysis of sediment during individual storm events above and below Lake Merriweather. This analysis showed relatively good agreement between modeled and observed suspended sediment concentrations.*

Upstream reaches of Little Calfpasture River from Lake Merriweather are not impaired, only the downstream reach is impaired. Therefore, the lake must be the cause of impairment, as rightfully acknowledged by the TMDL developer and the stakeholder.

However, this main cause of impairment was not sufficiently investigated. It was lumped with the watershed, and therefore, this main cause of impairment was ignored. We recommend a detailed investigation of the lake.

*DEQ Response: Lake Merriweather has been the subject of DEQ investigations for a number of years. This is reflected in the temperature and oxygen studies (Figures 4-17&18, pg. 45) and the depth measurements (Figure 6-7, pg. 109). Sediment transport through the lake was investigated by measuring sediment above and below the lake. DEQ is committed to continuing collecting data on the Lake and the Little Calfpasture in order to monitor progress and compliance with the Consent Order. Also, the lake was specifically included in the reduction scenario with the addition of a lake management strategy to reduce sediment. Although the upstream watershed is the source of much of the sediment that reaches the lake, the lake receives, transports and discharges sediment to downstream waters.*

The EFDC model in simulating Lake Merriweather was never calibrated or validated. It is mentioned in Brent (2009) that only the particle size and settling velocity were adjusted (page 126) to match the TSS concentration near the confluence (2-LCF000-02). Particle size distributions of the Little Calfpasture River watershed and Lake Merriweather are supposed to be known and settling velocities of various particles sizes are available in the literature. It is unclear the influences (share) of these parameters on the model results, with respect to LSPC parameters, because the results are combinations of both the models.

*DEQ Response: The EFDC model was calibrated to match observed suspended sediment concentrations below the lake. Since flow from the lake represents more than 99% of the flow in the Little Calfpasture River below the lake, data from this point was adequate for calibrating the EFDC model. Particle size and associated settling velocities were originally determined based on sediment collected from the lake. Collected values, however, represent a range and are variable in time and space, so initial parameters were adjusted during calibration.*

It is clear that the EFDC model is inappropriate to model the Lake Merriweather and combine it with the LSPC-based model of the rest of the watershed. As reported by USEPA (Shoemaker et al., 2005), EFDC has been tested in receiving water bodies such as large lakes, estuaries, and coastal bays, where sediment settling is more dominant than bed erosion or re-suspension and sediment transport. Lake Merriweather is not simply a receiving water body. It receives, transports, and discharges sediments, especially after significantly filling its bed with deposited sediment throughout its more than 40-years life and exposing its bed to shallow high velocity flows resulting accelerated erosion and transport. A strong sediment transport model is needed to model it.

*DEQ Response: The EFDC model is included in EPA's TMDL Modeling Toolbox and is appropriate for modeling hydrodynamics and sediment transport in lakes, as well as rivers, estuaries, wetlands, and coastal regions. EPA's TMDL Modeling Toolbox*



*Factsheet states that “EFDC has been used widely throughout the country to support TMDL development – Washington, California, Oklahoma, Florida, Mississippi, Alabama, North Carolina, West Virginia, Delaware, Pennsylvania, and Massachusetts.” (TMDL Modeling Toolbox Factsheet, USEPA- NERL, Athens, GA). Shoemaker et al. (2005), which is referenced by the commenter, also states that EFDC is appropriate for modeling sediment transport in lakes. “The model can execute in a fully coupled mode, simultaneously simulating hydrodynamics and sediment and contaminant transport...The model can be applied to rivers, lakes, reservoirs, estuaries, wetlands, and coastal regions” (Shoemaker et al., 2005).*

Sources of sediment, presented in Figure 1.1 and in several other places in the report (Brent, 2009), were derived from the above model results, which were not properly calibrated and validated, and therefore, these values may be considered approximate, qualitative, or even hypothetical, and are unreliable for developing TMDL.

*DEQ Response: Like all TMDLs, the results of the Little Calfpasture River TMDL represent best available estimates based on adequately calibrated model results.*

The right hand pie diagram of Figure 1.1 is not meaningful. Investigation of any sediment contribution from Lake Merriweather bed is a must in this TMDL. If any contribution found, a slice for Lake Merriweather must be added to Figure 1.1 as one of the sources of sediment to the impairment.

*DEQ Response: Based on this comment and feedback from the Final Public Meeting, this Figure was revised to show sediment contributions to the Little Calfpasture River above the lake, to the lake itself, and to the Little Calfpasture River below the lake.*

If contribution of sediment from lake deposits is found to be significant, removal of certain volume of sediment from the lake bed must be considered to make room for future deposits and avoiding downstream discharge to the impaired reach. A properly calibrated and validated model can be used to develop an effective and efficient management (maintenance) scheme.

*DEQ Response: It is not the goal of the TMDL to create a lake management or maintenance scheme. The TMDL details the issues and pollutants contributing to the aquatic life impairment, sources of the pollutants, and recommended allocation scenarios to meet water quality standards in the Little Calfpasture River. The Implementation Plan process would be the best place to detail lake management practices.*

One missing investigation or discussion is bed scour, armoring, and bank erosion that dominates in stream/river reaches located downstream of dams. The impaired reach is such a reach and, therefore some attention to these processes is desired in the investigation and modeling.

*DEQ Response: Bed scour is explicitly incorporated into the LSPC model. Critical shear stress parameters for deposition and scouring control the instream dynamics of*

*deposition and resuspension. Bank erosion was incorporated into the LSPC model through the use of the degraded riparian pasture land use. This approach was established in the Chesapeake Bay Model to compensate for HSPFs (and LSPCs) inability to explicitly model bank erosion.*

Finally, solution to any sediment erosion and deposition problem in a drainage network is to work with the nature and try to achieve equilibrium, in which the drainage system has enough transport capacity to transport the sediment generated with negligible erosion and deposition. This overall concept and guidance must be followed in the investigations, modeling, and arriving at solutions. Presently, Lake Merriweather flow depth is much shallower than its original depth resulting in increased flow velocities in order to discharge (release) similar storm generated flows. The increased flow velocities increase sediment transport (carrying) capacity picking up more sediment from the lake bottom and releasing it downstream. Because storage in the lake prolongs high flows, discharge of sediment continues. Effective solution would be to increase flow depth in the lake, reduce velocities, and reduce sediment transport capacity to reduce downstream sediment discharge. A properly calibrated and validated model will be useful in investigating and arriving at a precise scenario.

*DEQ Response: It is not the goal of the TMDL to create a lake management or maintenance scheme. The TMDL details the issues and pollutants contributing to the aquatic life impairment, sources of the pollutants, and recommended allocation scenarios to meet water quality standards in the Little Calpasture River. The Implementation Plan process would be the best place to detail lake management practices. The TMDL model will be helpful in this process, but it is possible that additional investigations may be needed to develop a comprehensive lake management strategy.*

## **SUGGESTED CHANGES IN THE REPORT**

- Page 1: The Watershed definition would be clearer and more accurate if it is revised to, “All of the land area that drains into a point, stream or river section, or a particular water body.”
  - *DEQ Response: Change made.*
- Page 1: Add in parenthesis (83 mi<sup>2</sup>) next to 53,395 acres.
  - *DEQ Response: Change made.*
- Page 2: Section 1.3 CURRENT SOURCES OF SEDIMENT must be expanded to include (i) stream bank erosion, as included in the April 14, 2009 presentation and (ii) Lake Merriweather as current sources of sediment.
  - *DEQ Response: Change made.*
- Page 3: The statement, “To account for these and many other important factors, VADEQ used two computer models .....,” indicates a wrong scientific approach. Solving a real world problem by sitting in front of a computer is not a practical

approach. Literature reviews, field investigations, visiting the problem sites, and making necessary measurements of missing information must be the initial steps of a scientific investigation before turning into the models.

- *DEQ Response: Numerous site visits and field investigations were made prior to and during the development of the Little Calfpasture River TMDL.*
- Page 3: The statement, “To make sure that estimates from the model were accurate, the model was tested with real-world data,” is not accurate here. The statement must continue with, “....., some from the watershed and some projected from nearby watersheds.”
  - *DEQ Response: The recommended revision would not be accurate.*
- Page 4: The Below Lake Merriweather pie of Figure 1-1 carries no meaning. This figure should have only one pie and a slice for Lake Merriweather contribution must be added there after properly estimating it. As reported elsewhere in the report that bank erosion is lumped with degraded riparian pasture, it should be indicated in this diagram.
  - *DEQ Response: Based on this comment and feedback from the Final Public Meeting, this Figure was revised to show sediment contributions to the Little Calfpasture River above the lake, to the lake itself, and to the Little Calfpasture River below the lake.*
- Page 5: “VADEQ will ask for public comments .....” sounds very limited. VADEQ should ask expert or peer review comments as well because the public may not be knowledgeable about the technical details in the process.
  - *DEQ Response: DEQ is committed to following the steps and procedures for public comment as outlined in DEQ’s “Public Participation Procedures for Water Quality Management Planning” (4/5/04) which can be found at [www.deq.virginia.gov/tmdl](http://www.deq.virginia.gov/tmdl).*
- Karst, sinkholes, and springs are mentioned throughout the report. A discussion on how were these handled (included or ignored) in the models is needed.
  - *DEQ Response: Large springs such as Augusta Springs and Wallace Mill Springs were explicitly incorporated as point sources in the model (Section 5.1). Other watershed features were incorporated implicitly through hydrologic parameters.*
- CHAPTER 5 must have an additional section: 5.3 LAKE MERRIWEATHER to discuss the sediment contributions from the lake.
  - *DEQ Response: Chapter 5 includes all sediment contributions, from the watershed area as well as the lake.*
- Figures 5-2 and 5-3 must be revised based on discussions above on Figure 1-1. The texts under 5.2 NON-POINT SOURCES must be also revised accordingly.
  - *DEQ Response: Change made.*

- Page 86: The statement, “LSPC is a dynamic watershed model.....,” is incorrect. The “dynamic” word is misused here. It may be replaced with “comprehensive,” an accurate and complementary statement.
  - *DEQ Response: DEQ used the EPA definition of LSPC as a “dynamic watershed model” in this section of Little Calfpasture TMDL.*
- Page 111: “Those loadings were added to a cell in the center of Lake Merriweather in the EFDC model.” This was a misuse of model. The center cell having higher flow velocity than the cells on the edges carried these sediment instantaneously satisfying its transport capacity and, therefore, not picking up sediment from the bottom and underestimating the erosion or re-suspension and degradation of lake bottom.
  - *DEQ Response: This source of sediment was small (1%) in comparison to sediment entering the lake from tributaries. Due to this fact, the advantages of reduced model complexity and shortened model run time outweighed the disadvantages of using this simplification.*
- The terms “CALIBRATION” and “VALIDATION” in Section 6.5 are misuses of these specific scientific terms because the model was not calibrated and validated according to scientifically acceptable methods. These terms should be replaced with “ESTIMATION OR PROJECTION OF MODEL PARAMETERS,” and describe accurately what was done to estimate or project the parameter values.
  - *DEQ Response: DEQ revised the text to clearly describe that hydrologic parameters were not obtained through direct calibration of the Little Calfpasture hydrologic model, but were obtained from the calibrated Chesapeake Bay Model. The sediment portion of the model was directly calibrated against suspended sediment samples collected from the Little Calfpasture River.*
- The so called “observed sediment rating curve” presented in Figure 6-17 (page 123) is flawed because the flows are not measured. The comparison presented in Figure 6-18 (page 123) based on such flawed curve is misleading. These figures must be removed and the texts describing these must be revised.
  - *DEQ Response: Change made.*
- Page 121: Error in Figure 6-15 axis label: lbs/m2 is a mixture of English and S.I. units which is unacceptable.
  - *DEQ Response: Change made.*

#### **Comments provided by Friends of the Maury and SELC (12/18/2009)**

We greatly appreciate the time you have taken to review our prior comments and to discuss them with us, including at the November 6 meeting with Jay Gilliam and our consultants. We also appreciate the additional clarification and details added to some

sections of the draft. However, we would like it made clear to DEQ and to the Water Control Board that the changes in the draft did not resolve the problems addressed in our comments, and that those comments remain applicable. We will not repeat those comments in any detail here. There are, however, a few key points that we would like to emphasize.

We continue to believe that the water quality targets for this TMDL are inappropriate. DEQ has proposed a site-specific change in the aquatic life standard for most of the Little Calfpasture. As a result, the TMDL does not seek to restore the Little Calfpasture to compliance with the generally applicable aquatic life standard in Virginia. This proposed change was premature, and did not fully evaluate the feasibility of achieving the generally applicable aquatic life standard. Options for achieving that standard should have been fully considered in the TMDL. We are attaching a copy of the September 18 letter to EPA regarding the special standard sent by the University of Virginia Environmental Law and Conservation Clinic on our behalf, for inclusion in the administrative record for this TMDL.

*DEQ Response: The letter from UVA to EPA will be included in the comment record.*

We submitted with our November 10 comments a report prepared by Dr. Deva Borah regarding the TMDL generally, and more particularly the data and models on which DEQ has based the TMDL. Dr. Borah's fundamental point is that the data and modeling are inadequate to capture the actual sources and transport mechanisms of sediment in the river and Lake Merriweather.<sup>1</sup> These flaws mean first that the TMDL may not have considered all options for restoring the health of the river below Lake Merriweather. They also mean that the predicted benefits from different scenarios may not be accurate. While it is positive that this draft provides additional explanation of the calibration process and an illustration of observed and modeled sediment during storm events (Figure 6-24), ultimately the new draft has not addressed these fundamental concerns, and as a result the TMDL remains a fundamentally flawed document.

*DEQ Response: Please see DEQ's detailed responses to Dr. Borah's individual comments and suggested changes.*

We recognize that DEQ is under a litigation-imposed deadline for this TMDL. This does not justify, however, the development of a TMDL based on inadequate information. At the very least, DEQ should address how to overcome the inadequacies in the data and modeling, and develop and commit to a concrete plan for collecting better data and refining the modeling in the future. As the matter now stands, there is no reason to be confident that the scenario laid out in the TMDL will actually achieve compliance even with the site specific standard for the Little Calfpasture.

*DEQ Response: Due to the concerns from stakeholders regarding the water quality of this waterbody, DEQ has committed to monitoring the Little Calfpasture River for ambient water quality parameters, aquatic life and DO for 2010-2011. These data will*

*be evaluated in comparison to TMDL findings, and if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL will be revised*

The new draft also continues to fail to address all potential management options for Goshen Dam and Lake Merriweather. The only management options for the lake in the TMDL scenarios are better compliance with the existing DEQ special order and increasing the depth of the lake through some combination of maintaining lake elevation and dredging. The new draft does include some additional discussion of dam removal and acknowledges that restoring Lake Merriweather to a riverine condition would fully restore the impaired reach of the Little Calfpasture. We appreciate the addition of this language, but continue to believe that this option should be fully analyzed in the TMDL.

*DEQ Response: The goal of the TMDL is to identify sources and limits of pollutants, not prescribe reduction measures. Modifications were made to the allocation scenario section (Section 7.4, pg. 143) in accordance with requests by the TAC. EPA has a number of requirements for TMDLs, including that of “reasonable assurance”, which is the reasonable guarantee that a TMDL will be followed through and the scenarios discussed can be acted upon. Since DEQ has no assurance that the dam will be removed nor a regulatory obligation to require its removal, this option could not be included among the successful allocation scenarios, though it was discussed in the detailed analysis of scenarios.*

Moreover, the TMDL continues to insufficiently address a variety of other potential options with respect to the dam and lake that might prove effective at restoring the Little Calfpasture. While some additions were made to this section, other possibilities, such as changing the water release regime in order to improve sediment transport out of the river and possible structural modifications to the dam, still are not included. For example, the TMDL did not consider whether the dam could be modified to reduce the need to drain the lake in advance of large storms in order to be able to release storm flows so as to better mimic the natural hydrograph. The failure to consider these options, and the lack of better data and modeling to evaluate them, will make it very difficult to consider them during the implementation phase.

*DEQ Response: As stated previously, the TMDL is not a prescriptive document. Modification of the dam would fall within the category of lake management, and all options that fall within that category are open to consideration during the Implementation Plan process, or beforehand if pursued voluntarily by the owners of Lake Merriweather and Goshen Dam.*

### **Comments provided by Brooke Spencer**

Please revise the TMDL to provide for improved water quality in Goshen Pass. My votes, contributions, and efforts always are behind protecting these beautiful natural resources we have in Virginia so that my children and their children can continue to enjoy what I have loved my whole life.

*DEQ Response: Thank you for your commitment to Virginia's natural resources. The Virginia Department of Environmental Quality (VADEQ) sets water quality standards or limits on the amount of pollution that is allowed in rivers and streams. A section of the Little Calfpasture River below the Goshen Dam fails to meet the general standard for aquatic life. This means that the river does not support a healthy and diverse community of bugs and fish. By identifying the causes of this problem in this TMDL report and then remediating them, the water quality in the Little Calfpasture and subsequently Goshen Pass will be improved and protected.*

**Comments provided by Shirlee Grody**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: The Department of Environmental Quality thanks you for taking the time to comment on this TMDL report.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that "the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam" (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be fully met (at DEQ monitoring station 2-*

LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. DEQ's demonstration and EPA's approval of the use change in the Little Calfpasture River were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when "dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use." TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.



*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

### **Comments provided by David Grace**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: The Department of Environmental Quality thanks you for taking the time to comment on this TMDL report.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a*

*0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment*

*sources throughout the watershed, and reductions coming from lake sediment management.*

**Comments provided by Marilyn Shaner Buerkens**

I swim in the Maury River in the Goshen Pass area. I also enjoy fish from this river. I am concerned about sediment in this river, as well as releases of water from Lake Merriweather.

*DEQ Response: DEQ appreciates your concern for this beautiful area of Virginia and thanks you for your comments regarding the Little Calpasture TMDL.*

I think DEQ should work to keep the highest possible water quality in these waters—for the sake of humans, invertebrates, and everything in between. DO NOT LOWER OUR QUALITY STANDARDS.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calpasture River prior to its confluence with the Calpasture River. DEQ's demonstration and EPA's approval of the use change in the Little Calpasture were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when "dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use." The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the revised standard for the Little Calpasture River.*

I was shocked (and scared) when I read in a local newspaper that water is released from the dam at Lake Merriweather after a drive-thru of the pass to ascertain no one is in the water. Yeah, right. When I swim, especially during the off-season while wearing a wetsuit, I can NOT be seen from the road, nor can I hear anything from the road. The paper also reported there is no public posting of dam releases. This seems less than responsible and sure took a toll on my relaxing swims. Please do your best to protect the glory of Goshen Pass. Again, do not lower our quality standards.

*DEQ Response: The TMDL does not regulate the safety measures taken to prepare for dam releases. The owners of the dam, the National Capital Area Council of the Boy Scouts of America, are under a Consent Order with DEQ with regards to the operation of the dam. According to this Order and its following amendments, Lake Merriweather is kept at full pool, except to prepare for emergency events which may require extra storage, such as flooding or large storm events. When lowering is needed, the Order requires the Boy Scouts to use an alternate method to draw down the lake other than the subsurface gate, whose use had been associated with fish kills and excess sediment*

release. To DEQ's knowledge, the gates have not been lowered for extended periods of time since March 2007.

### **Comments provided by Shawn Spencer**

I'm writing today as a longtime resident of Rockbridge County and frequenter of the Maury River at Goshen Pass, where I spent countless happy afternoons during my youth, and still visit every summer. Goshen Pass is fed by the confluence of the Calfpasture River and the Little Calfpasture River, the latter of which was dammed up and managed in such a manner that the section between the dam and the Maury River is now badly polluted. This pollution flows into the Maury River and causes trouble periodically.

*DEQ Response: DEQ appreciates your concern for this beautiful area of Virginia and thanks you for your comments regarding the Little Calfpasture TMDL.*

I am writing to ask that you NOT approve the UAA because it ignores the intent of the Clean Water Act and water codes in Virginia and tries to establish a water quality standard for the Little Calfpasture river below the Lake Merriweather dam that is far below water guidelines for Virginia (it now has a Stream Condition Index of 24 and should be at 60!). In fact, the UAA would set the water standard for the Calfpasture river below what it is now. This is unacceptable. These state lands are designated for wildlife and for recreational use. They must be protected from pollution.

*DEQ Response: The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ's demonstration and EPA's approval of the use change in the Little Calfpasture were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when "dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use." The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the revised standard for the Little Calfpasture River.*

The UAA's 'unattainability' finding looked at only one option to clean up the Calfpasture river, i.e. the removal of the Merriweather dam, and decided it could not be removed for various reasons and thus that the river could never be cleaned up. This is an insufficient basis on which to make that decision. There are alternatives, such as dredging the lake and reducing the amount of sediment pollution upstream of the lake. These options were not evaluated as they should have been. The health of the river should not be written off to avoid having to fix a dam.

*DEQ Response: The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable*

*water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality” (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>). The TMDL, on the other hand, sets a “pollution budget” for sediment for the Little Calfpasture, which identifies sources of pollution and sets reductions for those sources. The recommendations include upstream reductions (especially for pastureland along streams) and a lake maintenance plan, which could include such practices as dredging or the construction of a sediment forebay to capture sediment from the Little Calfpasture River before it gets to the lake. The details of reductions to sources of sediment will be the focus of the next phase in the TMDL process – the TMDL Implementation Plan.*

Goshen Pass is cherished by the residents of Rockbridge County. Please stand up for the people of Rockbridge County, the Clean Water Act and the water codes of Virginia and reject the UAA.

*DEQ Response: As stated previously, the UAA has already been approved by the State Water Control Board and, as of December 29, 2009, by the EPA.*

#### **Comments provided by Catharine Gilliam**

Thank you for your courtesy and availability during the Little Calfpasture TMDL process. You and your colleagues at DEQ have been very thoughtful in responding to requests for documents and allowing me to serve on the technical advisory committee.

*DEQ Response: Thank you for taking the time to serve on the Technical Advisory Committee and for submitting comments. The Committee’s insight and opinion were greatly appreciated by DEQ and essential to developing this report.*

Nevertheless, I do not find that there has been an adequate response to concerns expressed in terms of the substance of the report. From my first exposure to the process at the public meeting in April 2009, I have had several questions and concerns about the underlying approach.

I admit that I am not an expert in the Clean Water Act. But I understand the TMDL requirement to be 1) an effort to study why a section of stream has an unacceptable level of pollution, and 2) to develop a way to clean up that pollution and achieve a cleaner stream. What the DEQ has done is to look at the very short – and highly impaired – section of the Little Calfpasture River and change the rules. It seems that instead of finding a way to reduce the pollution to the truly acceptable level, the DEQ changed the standard to come up with a goal that could be met much more easily.

*DEQ Response: You are correct in that the TMDL identifies the sources of pollution in a stream and then sets reductions in order to achieve water quality standards. The process is continued in the TMDL Implementation (or Clean-up) Plan, which prescribes the practices needed and is a more detailed plan discussing **how** to reduce the pollution. The purpose of a Use Attainability Analysis (UAA) is to set water quality standards to achievable levels. EPA’s Introduction to UAAs website states “We believe that setting*

*attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality” (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>). The revised standard simply allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). This revised standard was approved by EPA on December 29, 2009.*

This approach is undoubtedly appreciated by those who cause the pollution – but it strikes those of us who want clean rivers as preposterous. I have spent much of my life, and unquestionably the most peaceful and pleasant moments, at a cabin downstream from this section. Many years ago I purchased the parcel of land adjacent to property that has been in my family for a long time. Now that my grand-nieces and -nephew enjoy the Maury River, Goshen Pass has been a special place to five generations of this family. I give these details so that you might understand why “just changing the rules” to accommodate a polluter is irrational and unacceptable to me.

*DEQ Response: The Little Calfpasture River and Goshen Pass area are truly treasures of the Commonwealth. DEQ reiterates that the Little Calfpasture will still have to meet the same water quality standard as all of Virginia’s rivers and streams at the DEQ monitoring station 2-LCF000.02. The UAA’s zone of recovery actually takes into account the “change in food supply” stressor which was identified in the TMDL as a natural effect of the change from a stream to a lake and back again. This is not an “accommodation” of a polluter, but simply an acknowledgement of the current state of the Little Calfpasture as a dammed river.*

DEQ seems to believe that the “Use Attainability Analysis” permits you to allow this higher level of pollution. I disagree and appreciate the knowledgeable explanation of why the draft TMDL relies on a step that violates the Clean Water Act, detailed in a letter from the University of Virginia Environmental law and Conservation Clinic to the EPA Regional Office dated September 17, 2009.

*DEQ Response: DEQ disagrees with the statement that the UAA permits a higher level of pollution; the level of sediment determined to be acceptable is based on the natural processes of the river system (including the lake) and the aquatic life found therein. The letter from UVA referred to above will be included in the official record of this TMDL. Also, the UAA process does not violate the Clean water Act, it is a recognized, practical option. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.”*

I want to return to an issue I raised during a meeting of the TAC at the Goshen Library, which I do not believe has been addressed in the latest draft report. This is a ‘Catch-22’ that results in a stalemate and an unhealthy river and an unsafe condition. DEQ has accepted as a given that a certain level of pollution is inevitable because of the way the dam is designed and is operated. It is a flawed design that is dangerous and causes pollution that should be

changed or removed. When the Army Corps of Engineers did a study several years ago to determine how the dam could be made safe, they limited their options based on unexamined 'environmental concerns.' I requested that your TMDL review examine the Corps report and see whether it does not make the most sense to change the dam that causes both a "high hazard" to lives and "significant impairment" to water quality. I believe that a combined, solution oriented effort between these agencies will show that other options are not only available but mandated by both safety and environmental laws.

*DEQ Response: The Dam Safety Evaluation Report on the Goshen Dam by the Army Corps of Engineers Report dated August 2006 was evaluated by DEQ staff during the TMDL process. However, there was no water quality information pertinent to the TMDL process within the report. As stated, the TMDL focuses on identifying the sources of water quality pollution, which ultimately is the Goshen Dam and Lake Merriweather. DEQ would be happy to work with any entity interested in dam removal options in order to ensure that the significant water quality concerns and issues which result from the removal of dam structures are taken into account. As stated in the ACE paper entitled Engineering and Ecological Aspects of Dam Removal – An Overview, the ACE must consider large variety of public interest concerns, including the "... determination of the effects of the dam removal on wetlands, fish and wildlife, water quality, water supply, energy conservation, navigation, economics, and historic, cultural, scenic, conservation, and recreational values" (Conyngham et al., 2006). Dam removal was an option discussed in the TMDL but not modeled as a reduction scenario.*

Furthermore, I think that the Nationwide Rivers Inventory review process requires that these options be reviewed, analyzed and be commented on. The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan.

In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten. My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised and public involvement would again be sought.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included*



in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02), which has been approved by EPA. The purpose of a UAA is to set water quality standards to achievable levels. EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

#### **Comments provided by Mary Buford Hitz**

Please revise the TMDL to provide for improved water quality in the now-polluted water of the Maury River as it flows through Goshen Pass. This area is a national treasure, and deserves better protection.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. The goal of the TMDL is to identify the pollutant, recognize the sources of the pollutant, and set reductions so that the waterbody can again achieve water quality standards. The Little Calfpasture River is a tributary of the Maury River and it is hoped that by improving the Little Calfpasture and reducing the amount of sediment in the river, the Maury will also be improved.*

#### **Comments provided by William H. Funk III**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: The Department of Environmental Quality thanks you for taking the time to comment on this TMDL report*



The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. That means fully meeting all applicable water quality standards in the Little Calfpasture River before it meets the Calfpasture River and forms the Maury River. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As*

*with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

### **Comments provided by Sunny Goode**

Please revise the TMDL in order to provide for improved and the required level of clean water in Goshen Pass.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. The goal of the TMDL is to identify the pollutant, recognize the sources of the pollutant, and set reductions so that the waterbody can again achieve water quality standards. The Little Calfpasture River is a tributary of the Maury River and it is expected that by improving the Little Calfpasture and reducing the amount of sediment in the river, the Maury through Goshen Pass will also be improved.*

### **Comments provided by Bryan Horner**

I am writing to you to express me serious concerns regarding the quality of water in the Maury River. It was recently brought to my attention by the Save Goshen Pass organization and after doing independent research as well I felt it necessary to write. It is clear that the Virginia DEQ needs to substantially revise the TMDL in order to provide for improved and the required level of clean water in Goshen Pass. Please take my concerns seriously and do what is right to protect our waterways. Thank you.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. The goal of the TMDL is to identify the pollutant, recognize the sources of the pollutant, and set reductions so that the waterbody can again achieve water quality standards. The Little Calfpasture River is a tributary of the Maury River and it is expected that by improving the Little Calfpasture and reducing the amount of sediment in the river, the Maury through Goshen Pass will also be improved.*

### **Comments provided by Susan Kepler**

Please revise the TMDL in order to provide for improved and the required level of clean water in Goshen Pass. I support "Save Goshen Pass". Please keep our water clean and safe for all.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. The goal of the TMDL is to identify the pollutant, recognize the sources of the pollutant, and set reductions so that the waterbody can again achieve water quality standards. The Little Calfpasture River is a tributary of the Maury River and it is expected that by improving the Little Calfpasture and reducing the amount of sediment in the river, the Maury through Goshen Pass will also be improved.*

### **Comments provided by Eric Walden**

I am writing to add my name to the list of those that believe while your department has spent a lot of time and effort evaluating the status of the Calfpasture rivers and their effect upon the water quality of the Maury River through Goshen Pass, I believe your requirement to perform full due diligence demands you review your results carefully and ensure they have not been influenced by external pressures to marginalize the negative aspects of the dam on the Little Calfpasture.

*DEQ Response: Thank you for taking the time to comment on the Little Calfpasture River TMDL. The TMDL report clearly states that the cause of the impairment of the Little Calfpasture River is the Goshen Dam and Lake Merriweather. The Dam and Lake are taken into consideration in the TMDL report when discussing scenarios which will return the river to its healthy, unimpaired state. In fact, a detailed, "no-lake" scenario was included in the allocation scenario analysis in Section 7.4 (pg. 143).*

I have enjoyed summers at Goshen Pass my entire life, and without clean water it is just another place in Virginia. If you have spent time there, you know that it is far more than this, and is very much worth the extra effort to protect this amazing asset into the future.

*DEQ Response: DEQ appreciates your concern for Virginia's natural resources. The Goshen area is certainly a treasure of the Commonwealth.*

**Comments provided by Wesley Jargowsky**

I wish to express my dissatisfaction the TMDL for the sedimentation problem in these rivers.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. The goal of the TMDL is to identify the pollutant causing the impairment in the Little Calfpasture, identify the sources of the pollutant, and then set reductions to again achieve water quality standards. The pollutant identified in the TMDL as causing the impairment is sediment.*

I don't think you can adequately model the situation that exists without giving serious consideration to the role Lake Merriweather plays in creating the problem. A substantial revision of the TMDL is needed to achieve the level of water quality that is both mandated and desirable. I am a concerned citizen and a frequent user of the Maury River and Goshen Pass. This ongoing problem needs to be solved.

*DEQ Response: You are correct in recognizing the Goshen Dam and Lake Merriweather as the causes of the impairment and the TMDL report clearly states this. In fact, the Lake was included in the modeling of the Little Calfpasture watershed. DEQ believes that the models chosen were appropriate and were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>). Your concern and interest in this beautiful area is appreciated by DEQ. It is hoped that the TMDL will lay the foundation or framework for continuing efforts to improve and clean-up the Little Calfpasture River.*

**Comments provided by Linda Larsen**

I am concerned with two aspects of the proposed TMDL.

1. The proposal to change the measurement of the impairment of the Little Calf Pasture River to a SCI score below 20.5 is not logical or acceptable. The measurement of an unimpaired river in the Commonwealth is a SCI score of 60. There seems to be an inference that this river is different, but no proof is provided to back this recommendation. The goal for the level of impairment of the Little Calf Pasture River should be a score of 60, just like all of the other rivers in this Commonwealth.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. DEQ disagrees with the statement “The proposal to change the measurement of the impairment of the Little Calf Pasture River to a SCI score below 20.5 is not logical or acceptable.” The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring Station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which proposed this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards, but DEQ will defer to EPA’s decision on the matter. As of 12/29/2009, the Little Calfpasture UAA was approved by EPA.*

2. There is no mention of the damage caused to the Little Calf Pasture River by Lake Merriweather or the dam. The TMDL is incomplete without fully acknowledging the damage from the Lake and then including plans and changes that the National Capital Area Council can make to prevent the continued pollution of this river from the presence of their recreational dam and lake. The TMDL did not deal with the option of removal of the dam, which would be the healthiest thing for the Little Calf Pasture River. To have ignored that as a proposed solution makes this TMDL incomplete at best.

*DEQ Response: The TMDL report clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. The TMDL only identifies the problem, its sources and the reductions needed; the process that deals with plans and prescribed practices is the Implementation (or Clean-up) Plan, which follows this TMDL. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from a lake management plan. Based on comments received, a scenario was included in the TMDL report in Section 7.4 which details a “no-lake” scenario where the dam was removed and the river was returned to a more natural state (pg. 143).*

I appreciate your work with the TMDL, I hope that you will include these changes in the TMDL so this document can be used to help the Little Calf Pasture River be healthier, and in turn the Maury, the James and the Chesapeake Bay will all be helped.

*DEQ Response: It is true that if the aquatic life community of the Little Calfpasture were returned to a healthy state, the Maury River, James River, and Chesapeake Bay would all be improved. This is the goal of the TMDL process – to assist in water quality improvement efforts by identifying the problem (sediment), its sources, and the level of sediment at which a healthy community can be restored.*

### **Comments provided by Wistie Jobe**

With warmest wishes and a plea for the reinstatement of the clean water act for the Maury River and the TMDL, so that our children in Lexington won't fear poisoning of their fish and water, that we might be assured of your pledge to maintain pure water for generations to come.

*DEQ Response: Thank you for taking the time to comment on the Little Calfpasture TMDL. The goal of the TMDL is to identify the pollutant, recognize the sources of the pollutant, and set reductions so that the waterbody can again achieve water quality standards. The Little Calfpasture River is a tributary of the Maury River and it is expected that by improving the Little Calfpasture and reducing the amount of sediment in the river, the Maury through Goshen Pass and into Lexington will also be improved.*

### **Comments provided by Elizabeth Bradford**

Please modify the TMDL on the portion of the Little Calfpasture River below the Lake Merriweather Dam so that it will effectively reduce the silting that is disrupting the wildlife below the dam.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. The purpose of the TMDL is to set reductions of sediment that will allow the river to return to its natural, healthy aquatic life community. DEQ believes that the TMDL in its current form does this for the Little Calfpasture River.*

### **Comments provided by Sarah Myers**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: The Department of Environmental Quality thanks you for taking the time to comment on this TMDL report.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to*

*expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA’s TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

#### **Comments provided by Yates Spencer**

I lived On the river in Rockbridge Baths, VA for seven years (1999-2006) and continue to visit there often. I have repeatedly witnessed the profound effects the Lake Merriweather dam has on the river and I hope you will seriously consider the concerns expressed in this letter. Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: The Department of Environmental Quality thanks you for taking the time to comment on this TMDL report.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to*



*expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

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- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

### **Comments provided by Cathryn Harbor**

I am very concerned about the lack of oversight into the Maury River at Goshen Pass and appreciate the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: DEQ thanks you for taking the time to comment on this TMDL report.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture River will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

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*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

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*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

#### **Comments provided by Barbara Franko**

Please be sure that the integrity and spirit of the Clean Water Act is followed in the process of developing and approving the current Calfpasture TMDL. Changes should NOT be made to the rules in order to accommodate other results that support the current Meriweather dam and its shortcomings. The purpose of the Clean Water Act is to protect our rivers - please do not allow it to support a diminishment in the quality and flow of the beautiful Maury river.

*DEQ Response: Thank you for taking the time to comment on the Little Calfpasture River TMDL. The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ's demonstration and EPA's approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when "dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use." The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. The TMDL document clearly states that "the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam" (Chapter 1, pg. 1). By improving the Little Calfpasture, it is hoped that the Maury River will also be improved.*

### **Comments provided by Ann Tutwiler Carman**

Although I currently live in Maine, I am writing as a sixty-year, "born and bred" resident of Lexington, Virginia, to urge you to protect Goshen Pass from any sort of development. You will be receiving (and have received, I'm sure) many letters and emails in support of Goshen's preservation, so I will be brief.

*DEQ Response: Thank you for taking the time to comment on the Little Calfpasture River TMDL.*

Goshen Pass is precious as an important water source, as a low- impact recreation area, as an historical site, and as an internationally-known area of natural beauty. It also provides important natural habitat for the wildlife of Rockbridge County, which is particularly important as the county's residential areas have encroached on our woodlands and on many fields.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. By reducing the amount of sediment in the Little Calfpasture, the Maury through Goshen Pass will also have less sediment and a healthier aquatic community.*

There is no positive benefit in development of Goshen Pass and its environs. Generations of Rockbridge residents have enjoyed all that it offers, as well as native Americans who were here long before us. Please do not take this important resource away from us and from the many visitors who seek out its peacefulness and beauty every month of the year.

*DEQ Response: DEQ can assure you that there are no plans to "take this important resource away" from the people of Rockbridge County. In fact, the TMDL lays the framework for the improvement of the Little Calfpasture and its return to a healthy river.*

### **Comments provided by Greg Moore**

I'm writing you to urge you to take the necessary steps to clean up Goshen Pass in Rockbridge County. This river has been polluted for too long now because of Meriweather Dam. I am a life long resident of Rockbridge County. I have fished the pass since the early 60's and had boy scout camporees along the river several times. This is truly a treasure for our county and for future generations. Let's do all we can do to protect this part of nature God has given to us all. How can we afford not to do what it takes to keep the water pure for all to enjoy? I'm sure you want to make a difference.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL. You are correct that the cause of the impairment on the Little Calfpasture is the Goshen Dam and Lake Merriweather. The TMDL Report also clearly states this. The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. By reducing the amount of sediment in the Little Calfpasture, the Maury through Goshen Pass will also*

*have less sediment and a healthier aquatic community. This TMDL lays the framework for the improvement of the Little Calfpasture and its return to a healthy river.*

### **Comments provided by Gordon Dalton**

I am writing you in order to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report does all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: Thank you for your comments on the Little Calfpasture TMDL report.*

In addition to its special place in the hearts of many Virginians, the Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved*



*the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

### **Comments provided by George McVey**

I am writing to comment on the TMDL report. Thank you in advance for your consideration. Recognizing that the report has many facts and figures, I am hoping to appeal to our sense of common sense and fairness.

*DEQ Response: Thank you for taking the time to comment on the Little Calfpasture River TMDL.*

My wife and I have 700 acres just below Rockbridge Baths, Virginia with 3.5 miles of frontage on the Maury. We began putting this tract together in 1991 - and have eaten peanut butter crackers ever since to make things work! In 2007, we placed the whole farm under a conservation easement. We have also changed our farming practices, e.g., removed the livestock, established buffers, etc. Many of my neighbors have done likewise.

*DEQ Response: Your commitment to protecting Virginia's natural resources is admirable. It is hoped that more landowners along the Little Calfpasture, both upstream and downstream of the lake will do the same.*

After a stretch of rainy days, you can drive up Route 39 from our farm and follow the mud-flow right up to the dam. That beats any other evidence that we can find. From our perspective, it has gotten significantly worse since we have owned the farm, resulting (at our farm) in: a wider/shallower/warmer river channel, significant loss of actual acreage/streambank from worse floofing, and an overall negative change in the river ecology, e.g., many of the fish have sores, more moss/algae floating down the river, etc.

*DEQ Response: DEQ's Enforcement Program has investigated and confirmed that numerous times the operation of the dam has caused environmental degradation. These enforcement actions are detailed in section "2.5 VADEQ Enforcement Actions" of the TMDL Report (pg. 14) and were taken into account in the modeling process. The Clean Water Act recognizes uses of waterbodies as they existed on the effective date of the Act (November 28, 1975). Since this dam was completed in 1966, the existing use of the water body is recognized.*

We recognize that the Lake Merriweather and its dam are not the only problems, but they are a big problem. It is time to address the big problems, and others, in a way that improves stream health, rather than accomodates them. From the people that I do speak with that do have a scientific background, I am told that DEQ's report is discouraging, as it basically understates the lake's/dam's role, changes the water quality standard for the degraded stream section inappropriately, etc.

*DEQ Response: The TMDL document clearly states that "the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam" (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. The revised standard only allows for a 0.74 mile zone of recovery from the dam to the*



*point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia's Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

Did you ever read Dr. Seuss's "The Lorax"? . . . To paraphrase, unless people like you care a whole awful lot, things will not get better, they simply will not. The Maury and our children deserve a whole lot better. We are trying to do our part, and I hope that you will to - beginning with a visit to the dam after a rainy stretch. We should focus on fixing the problem rather than lowering the standards.

*DEQ Response: In fact, the TMDL lays the framework for the improvement of the Little Calfpasture and its return to a healthy river. The next step in the process is a Implementation or Clean-up Plan which details the plan and discusses practices that can be implemented in this specific watershed to improve water quality. The Implementation Plan is heavily focused on community involvement and all are welcome to give input on how the plan should be constructed. Your insight as a landowner who has already taken steps to preserve the river would be greatly appreciated.*

#### **Comments provided by J. Randolph Hutcheson**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. As a property owner in Rockbridge County with property adjacent to the Maury River, I want to ensure that this report does all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: Thank you for taking the time to comment on the Little Calfpasture River TMDL.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft, DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the*

*TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA’s TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

An additional concern is the safety of the dam. It is my understanding from the The Virginia Department of Conservation and Recreation and the Virginia Dam Safety Act that this type of dam would not be permitted or allowed under the current guidelines or standards in place today.

*DEQ Response: The Virginia Department of Conservation and Recreation (DCR) currently regulates and conducts dam safety inspections. You are probably correct that this type of dam would not be constructed today; however, it is a "pre-existing condition" for the river and was included in the TMDL report and the associated modeling. The Clean Water Act recognizes uses of waterbodies as they existed on the effective date of the Act (November 28, 1975). Since this dam was completed in 1966, the existing use of the water body is recognized. Many stakeholders in the TMDL process were interested in a "no-lake" scenario – how the removal of the lake would impact water quality in the Little Calpasture River. Based on comments received, a scenario was included in the TMDL report in Section 7.4 which details this option (pg. 143).*

### **Comments provided by Tom Thomson**

I am writing to comment on the draft TMDL report prepared recently by the Department of Environmental Quality. As a property owner on the Cowpasture River in Bath County, I have an interest in ensuring that this report does all that is legally possible and required to address the long term problems of pollution of the Little Calpasture River and the Maury River into which it flows.

*DEQ Response: Thank you for taking the time to comment on the Little Calpasture River TMDL.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft, DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As*

*with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

### **Comments provided by Rick Klein**

Thank you for considering my comments on the water quality issues in Goshen Pass. We have had a cabin in this area for 25 years and have raised our three kids on the banks of this beautiful river. Not only is it one of the most picturesque places in Virginia, but is also so visible to all as Rte. 39 is virtually right on top of the river for most of the way.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL.*

Where the run-off enters the Maury river just above the "swinging bridge" (on the Town of Goshen end of the pass) from the Lake Meriwether Dam is a very obvious silt and mud streak that discolors the "left" bank side of the river for more than a mile! This

unfortunately fouls the entire river, no matter what activity you might want to do in this river, and is unsightly to all who view the river from the road.

*DEQ Response: You are correct that sediment is a problem and is the ultimate cause of the aquatic life impairment in the Little Calfpasture River. This TMDL report identifies the pollutant (sediment), recognizes its sources, and sets reductions to again achieve water quality standards. It is expected that by improving the Little Calfpasture, the Maury River through Goshen Pass will also see enhancement.*

Apparently the dam at Lake Meriwether has problems that not only include polluting the Maury river, but might constitute a very danger of failure in bad weather conditions that could lead to loss of life and property. The recent rejection by the National Boy Scouts, that we are very pleased took place, also highlighted the safety problems with the dam that are now part of the public record and could be the source of huge legal problems should the dam fail. I think every effort should be made to correct the problems caused by this hazardous dam before something terrible happens even worse than the daily pollution of Virginia's prettiest river.

*DEQ Response: The TMDL document clearly states that "the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam" (Chapter 1, pg. 1). The Clean Water Act recognizes uses of waterbodies as they existed on the effective date of the Act ( November 28, 1975). Since this dam was completed in 1966, the existing use of the water body is recognized. The Virginia Department of Conservation and Recreation (DCR) currently regulates and conducts dam safety inspections. The TMDL did not consider the safety of the dam as this is separate from water quality concerns. The lake, dam and its operation were included in the modeling which was done in preparation for the TMDL study.*

### **Comments provided by Fred Copithorn**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: The Department of Environmental Quality thanks you for taking the time to comment on this TMDL report.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. Since the Little Calfpasture is immediately upstream from the beginning of the Maury River, I am greatly concerned about how DEQ defines and proposes to address the problems in the TMDL plan. In the current draft DEQ has gone significantly too far to accommodate - but not clean up - the primary source of the pollution.

*DEQ Response: The goal of the TMDL is to identify the pollutant causing the impairment, identify sources of that pollutant, and set reductions for those sources in order to meet water*

*quality standards. The next step in the TMDL process is to create an Implementation Plan (or Clean-up Plan), which details the practices that should be adopted in order to achieve the TMDL and water quality standards again. The Implementation Plan is the best place to expand upon the opportunities and options available to reduce sediment levels in the Little Calfpasture River.*

It is clear that Lake Merriweather in its current condition is the source of the pollution analyzed in the TMDL. It is not proper to simply lower the standard so that this section of the Little Calfpasture will be able to meet it, with the result that these rivers have unnecessarily high levels of siltation. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1). The TMDL is aimed at meeting the existing state-wide water quality standard in the Little Calfpasture River prior to its confluence with the Calfpasture River. DEQ’s demonstration and EPA’s approval of the use change in the Little Calfpasture River immediately below the dam were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when “dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use.” The revised standard only allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at DEQ monitoring station 2-LCF000.02). DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows this zone of recovery. DEQ supported and the State Water Control Board approved the UAA as part of the Triennial Review of Virginia’s Water Quality Standards. As of December 29, 2009, EPA approved the UAA for the Little Calfpasture River. TMDLs are continually reevaluated and reviewed based on collected data from monitoring. DEQ has committed to continuing benthic, ambient and Dissolved Oxygen monitoring on the Little Calfpasture River. If this monitoring reflects a need for modification of the TMDL, DEQ will address the need and solicit public involvement in that process.*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included*



in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwqtsc/Toolbox-overview.pdf>).

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*

#### **Comments provided by the Rockbridge Area Conservation Council Land Use Com.**

The Rockbridge Area Conservation Council has reviewed the draft TMDL for the Little Calfpasture River (Brent, 2009) and offers the following comments through its Land Use Committee. Although RACC appreciates the significant effort that has been undertaken on behalf of the impaired section of the tributary to the Maury River above Goshen Pass, we find significant shortcomings in the draft TMDL that will limit its ability to create meaningful improvements in the water quality of the Little Calfpasture River and the Maury River.

*DEQ Response: Thank you to the Committee for taking the time to review and comment on the Little Calfpasture River TMDL.*

A primary deficiency in the draft TMDL is clear misrepresentation of the obvious cause of the water quality impairment, which is the sediment load from Lake Merriweather. We applaud the lifting of the water outlet of the lake to improve oxygen levels, but suspect sediment to be a greater source of impairment. Our perception is that sediment delivery below the dam is caused by the presence of Lake Merriweather, the operation of the dam spillways to manage the lake and preserve the dam, and land uses adjacent to the lake. Yet these real causes of the impairment are only minor parts of the modeling effort and proposed action. The Little Calfpasture River above the lake is not impaired (Figure 4-2) (pg.26), yet landowners upstream will be asked to undertake the bulk of the remediation. Citizen observation of significant sediment contamination downstream of



the lake is inconsistent with a major conclusion of the report that the lake is a sink for sediment, i.e., more sediment entering the lake than leaving. Another inconsistency is the conclusion that the lower amount of sediment delivered over a longer time is the ultimate cause of impairment. We believe this conclusion results from a significant lack of sediment concentration data as well as the choice of hydrological models and modeling parameters. Detailed comments are given below.

*DEQ Response: Observation is a powerful tool in water quality investigations. However, in this case, the old adage that “looks can be deceiving” is correct. The problem lies with the loading potential of turbid water. Sediment from upstream sources is flushed into the lake during and directly after a precipitation event, but the effects of the event are seen for a long period of time in the turbidity of the outflow from the dam. This is because the lake traps some sediment, but releases the remaining sediment over a longer time period. This produces longer exposure period to high turbidity, and higher concentrations of sediment in the water column, measured in Total Suspended Solids (TSS), but not necessarily a larger amount of sediment(see Figure 4-33, pg.64). To remedy the TSS exposure duration issue, an additional TMDL endpoint was implemented so that reductions were set to produce a simulated TSS concentration that exceed 3 mg/L no more than 22% of the time. An addition, if more sediment were leaving the lake then entering it, the lake would be a scour point, becoming deeper over time. Data collected by DEQ and the Boy Scout’s own experience proves this is not the case, and the lake is slowly filling in with sediment (Section 6.2.5, pg. 108).*

A second major shortcoming of the draft TMDL is the choice to reduce water quality standards for the impaired reach downstream of the dam. Insufficient evidence is produced to validate the claim that it is the discharge of lake water that limits the ability to achieve the appropriate ecology for benthic fauna downstream of the dam. Are all dams in the region followed directly by such impaired reaches? In such a small river, would not the stream recover its ecological diversity within several channel widths or pool-riffle sequences where proper riparian habitats are maintained? We are strongly opposed to changing the standard for the impaired reach downstream of the dam because it is not clearly related to the implied causes—the simple existence of Lake Merriweather and its management.

*DEQ Response: The TMDL reviews three stressors that were identified as causing the aquatic life impairment on the Little Calfpasture: lack of dissolved oxygen, excess sediment, and a change in available food supply. It is DEQ’s hope that the modifications made to the dam will improve the dissolved oxygen concentrations, and this TMDL report focused on the sediment issues, which only leaves the change in available food supply. This is a natural state resulting from the adjustment from river to lake and back to river. Granted, and clearly stated in the TMDL, this would not have occurred without the presence of the Goshen Dam and Lake Merriweather. However, DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which simply allows for a 0.74 mile zone of recovery from the dam to the point where the original, state-wide standard must be met (at DEQ monitoring station 2-LCF000.02). The UAA was approved by EPA on 12/29/2009.*

*The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality"*

*(<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>). DEQ's demonstration and EPA's approval of the use change were based on 40 C.F.R. 131.10(g)(4), which allows a subcategory of a use when "dams, diversion or other types of hydrologic modification preclude the attainment of the use and it is not feasible to restore the water to its original condition or to operate such modification in a way that would result in the attainment of the use" (From Electronic Code of Federal Regulations at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div8&view=text&node=40:21.0.1.1.18.2.16.1&idno=40>).*

Lastly, we request removal of the assertion made in the draft TMDL that removing or modifying the dam is not a "feasible option" (p. 73). This feasibility of this option was not studied and this assertion is therefore inappropriate to the TMDL. Removal of the dam, modification of the dam and discharge operation, and by-pass are all options that could effectively mitigate the documented impairment.

*DEQ Response: The TMDL was revised to accommodate this comment, which was made by a number of stakeholders. All references to "feasible" options were eliminated from the draft report. Also, a detailed "no-lake" scenario was included in the allocation scenario analysis in Section 7.4 (pg. 143).*

A further unsupported assumption is that of future compliance with DEQ dam operation enforcement actions. The TMDL report cites a history of non-compliance and failures in self-reporting and record keeping for the Lake Merriweather Dam. No new information is presented to support use of a best case compliance scenario. At a minimum, installation of automated gauging, or other dam control monitors, with data logging and remote reporting should be required of the owner operator.

*DEQ Response: DEQ is committed to continuing collecting data on the Lake and the Little Calpasture in order to monitor progress and compliance with the Consent Order, which is managed by DEQ's Enforcement Program staff. The current management of the dam has been forthcoming with information and data, whereas the Consent Order is based on events that took place over fifteen years ago. Automated gaging and other dam control monitors are welcome to be installed on a voluntary basis, but as it currently stands, the Consent Order does not require those devices, and DEQ has no legal authority to require them.*

Specific comments:

-- The sediment loads modeled at the confluence, below the dam, and above the lake are based on inadequate data. Sediment load in most of the watershed is completely uncalibrated, including the use of likewise uncalibrated turbidity measurements collected by the DGIF upstream and downstream of the lake. This lack of data leads to speculative model results, such as found on page 134, finding that sediment input levels to the lake

are greater than output levels from the lake. This result is only a function of model tuning, and negates the DGIF observation that water leaving the lake is almost universally more turbid than water entering the lake (Figure 4-22)(p.49), except for a single grab sample on the day of a rain. The limited sediment data for the entire watershed are presented in the rating curve for the Little Calfpasture confluence in Figure 6-17(p.122), and these data are insufficient given what is known about suspended sediment rating curves. Moreover, given that the turbidity data themselves show that lake levels are a significant factor in downstream sediment loadings; this rating curve is unrelated to land uses upstream, and therefore suspect. Suspended sediment, especially in smaller basins, is generally not linear with increasing discharge (Asselman, 2000, Horowitz, 2003). The data presented are primarily taken during lower flows that lack sediment, and just one data point has a higher concentration that is representative of times when high flows are moving sediment. This one data point does not likely represent a time when lake levels are lowered and bare sediment is exposed to erosion (the poor record keeping of lake management limits the ability to interpret and model the release of sediment). To fit a linear relationship to these poorly representative data creates an inappropriate rating curve that severely underestimates the high-flow sediment delivery. Even when sediment rating curves are developed over the full range of flow levels and seasons, rating curves tend to underestimate annual load. Moreover, the high-flow sediment rating curve will be significantly impacted by the lake level at the time of sampling, as well as other seasonal conditions related to vegetation cover (Horowitz, 2003). We strongly urge the DEQ to seek additional data to capture the sediment delivery from the watershed that has been observed downstream. These data would necessarily include continuous turbidity monitoring along with frequent suspended load sampling to calibrate a sediment flux into and out of the lake. These data can be used to improve the modeling effort to include sediment delivered from the lake, which we feel is under-represented in the draft TMDL modeling effort.

*DEQ Response: The limitations of turbidity observations as ascribed to loading potential are detailed above. DEQ disagrees with the statement that the model loads are “based on inadequate data” and asserts that adequate sediment data were used to calibrate the Little Calfpasture sediment model. The model was calibrated against more than 80 suspended sediment samples collected during the calibration period. After comments were received in October from Dr. Borah, a professional engineer contracted by the SELC and Friends of the Maury to review the TMDL, DEQ added to the report an analysis of sediment during individual storm events above and below Lake Merriweather. This analysis showed relatively good agreement between modeled and observed suspended sediment concentrations (Section 6.5.2, pg.120). DEQ has committed to continuing benthic, DO and ambient monitoring on the Little Calfpasture for 2010-2011.*

-- The lake and its sub-watersheds (10-17) are a significant portion of the watershed and its non-forested land use. We think it would be appropriate to separate the modeled sediment source data in these portions of the watershed from the rest of the watershed for the LSPC watershed model (Figure 5.5). Moreover, the sediment loading information should be clearly presented as uncalibrated model loadings rather than actual sediment delivery.

*DEQ Response: The comment was made at the Final Public Meeting that the sediment contribution of lakeside lands to Lake Merriweather was confusing. The Figure 1-1 (also Figure 5-2) was changed to accommodate this comment and a specific graph was added detailing the lake's influence. Figure 5-5 simply shows the sediment contributions on a unit area basis for the entire watershed and its landuses. It would not be proper in this case to portion out a piece of the watershed simply due to location. DEQ disagrees with the assertion that the sediment model was "uncalibrated". DEQ used EPA's guidance (USEPA, 2006. EPA BASINS Technical Note 8: Sediment Parameter and Calibration Guidance for HSPF) as well as guidance developed by Donigian and Love (Donigian and Love, 2003. Sediment Calibration Procedures and Guidelines for Watershed Modeling) to calibrate sediment parameters in the Little Calpasture River model.*

-- Publically available images of Lake Merriweather (USGS orthophoto quadrangles, Rockbridge County black and white, and color photography) show significant turbid plumes in the lower lake when the upper 1/3 of the lake is clear. The sediment plumes appear to originate near the banks in the shallow western portion of the downstream 2/3 of the lake. We question whether the modeling used in the draft TMDL incorporates this kind of sediment redistribution and possible shoreline erosion, given that sediment detention and storage are the only effects of the lake modeling. After 40+ years of operation, bathymetry surveys suggest the permanent sediment storage volume in the reservoir is significantly decreased and sediment throughput or re-entrainment is therefore likely.

*DEQ Response: The EFDC model used for the lake does indeed include this sediment redistribution, and all other natural lake-system processes. The statement made by the RACC that "bathymetry surveys suggest the permanent sediment storage volume... is significantly decreased" supports the TMDL's assertion that there is more sediment entering the lake than exiting.*

-- The only time when the empirical data of benthic fauna quality near the confluence reached a satisfactory score was during extended drought conditions when little water was released from the dam, and presumably the lake level was not lowered, and thus little sediment was exported from the lake. During normal years, benthic fauna levels are significantly lowered.

*DEQ Response: There could be a number of reasons for this, including reduced flow levels. The TMDL sediment limit was chosen because the SCI scores indicate that the sediment loading conditions were conducive to supporting a healthy benthic community. The allocation scenarios discussed in Section 7.4 (pg.143) discuss the possible methods of reducing sediment in the watershed to these levels.*

--Although food supply, DO levels, and sediment have been identified as the primary stressors, impacts from chemical contaminants such as pharmaceuticals, arsenic, agricultural chemicals, and other compounds associated with the land uses in the watershed remain unknown.

*DEQ Response: That is correct. DEQ is currently considering monitoring parameters and methods in order to remedy the microconstituent gap in Virginia's water quality data. However, the TMDL study looked at a range of possible stressors including toxics, detailed in Chapter 4 of the report (Chapter 4, pg.25). The three addressed in the report were deemed to be the "Most Probable Stressors". If additional data comes to light which changes this analysis, the TMDL can and will be modified.*

**Comments provided by Mary Stuart Gilliam**

I write concerning the TMDL for the Calf Pasture River.

*DEQ Response: Thank you for your comments on the Little Calfpasture River TMDL.*

There should be no compromise on enforcement of the requirements and standards of the Clean Water Act. The source of pollution here affects a wide area. "We all live downstream."

*DEQ Response: You are correct that everything we do impacts our neighbors downstream. DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

**Comments provided by the Virginia Department of Conservation and Recreation**

I am writing to submit comments on the Little Calfpasture TMDL in Augusta and Rockbridge Counties for the benthic impairment present in the watershed on behalf of the Virginia Department of Conservation and Recreation.

*DEQ Response: Thank you for taking the time to comment on this TMDL.*

I have reviewed the TMDL document and have the following comments:

- On page 73, it is stated that the removal of the dam is a cost prohibitive strategy to address the benthic impairment. Without knowing the cost of all of the recommended scenarios in the TMDL study, it doesn't make sense to rule this one out as cost prohibitive. It could be considered as an implementation strategy during the implementation plan development process, which is when the associated costs and benefits of best management practices are typically considered and weighed.

*DEQ Response: The TMDL was revised. All references to “feasible” options were eliminated from the draft report. A detailed “no-lake” scenario was included in the allocation scenario analysis in Section 7.4 (pg. 143). A complete cost-benefit analysis is included in the TMDL Implementation Plan; however, there is no reasonable assurance that the removal of the dam would be implemented so it was not modeled. Restoration of the Little Calfpasture to a riverine system would be a completely voluntary action on the part of the Boy Scouts.*

- It is clear that the TMDL cannot be met without full cooperation from the Boy Scouts with respect to operation and maintenance of the dam. On page 75 in the document, I would recommend including an explanation of how VA DEQ will ensure full compliance with the consent order since there has been a history of violating this agreement to date.

*DEQ Response: DEQ is committed to continuing collecting data on the Lake and the Little Calfpasture in order to monitor progress and compliance with the Consent Order, which is managed by DEQ’s Enforcement Program staff. The current management of the dam has been forthcoming with information and data, whereas the Consent Order is based on events that took place over fifteen years ago.*

- On page 97, it is stated that an assumption was made regarding the constant nature of the ratio of pasture to cropland. It would be useful to check with the Headwaters and Natural Bridge SWCDs to make sure that cropland acres have not increased in recent years over pasture due to the increase in corn prices if this was not already done during the TAC meetings.

*DEQ Response: The Headwaters and Natural Bridge Soil and Water Conservation Districts were active participants of the Technical Advisory Committee during the development of this report and their input was greatly appreciated.*

- The table shown on page 139 should include a transitional land use category to account for land disturbance that would be necessary in order for the land use conversions shown to occur. I would also recommend including some discussion of the role of the Virginia Stormwater Management Program Permit in regulating land disturbance in the Commonwealth.

*DEQ Response: In Table 3-1 (pg. 23), the Transitional Land Use, which includes the land covers of barren, mine/quarry, bare soil and forest harvest, was determined to have no acres in the Little Calfpasture River watershed; therefore, it was not included in Table 7-3 (“Projected Future Growth Land Use Changes in the Little Calfpasture River Watershed”). The VSMP Program is currently under review and public comment and so subject to change. When finalized, it will be included in every sediment TMDL developed in the Commonwealth.*

- On page 142, it is stated that removing the dam could not be considered as a restoration strategy since there is not reasonable assurance that the property

owners would be willing to do this. However, it is also unclear as to whether or not there is reasonable assurance that the property owners would be willing to implement the lake management strategies necessary to meet the TMDL. Has there been an effort to determine whether the property owners would be willing to consider this option?

*DEQ Response: The “Reasonable Assurance” section of a TMDL has been defined by EPA as “a demonstration that TMDLs will be implemented through regulatory or voluntary actions” (<http://epa.gov/owow/tmdl/guidance.html>). While there are a wide variety of cost-share programs on both the state and federal level available to assist landowners interested in water quality improvement practices, there are no such programs for dam owners.*

- The TMDL report states that the lake must be maintained at full pool except for during flooding emergencies. Were a given number of emergencies and the associated releases of additional sediment included in the TMDL and made up for through additional reductions to other sources?

*DEQ Response: During model runs under existing conditions, raising and lowering of the Goshen Dam gates were simulated as described in Section **Error! Reference source not found.** The simulation included 5 gate lowering events that ranged from 4 ft to 10ft (**Error! Reference source not found.**). Only recorded lowering events from 2000-2006 (the modeling period) that were larger than 2 ft and longer than 2 days were modeled. Smaller and shorter lowerings would not have much impact on daily sediment loads and would be difficult to accurately model without specific information on the timing and mechanics of individual lowering events (e.g., which gates were lowered, at what time, and how long did lowering take).*

- The WLA for the TMDL includes a load from land disturbance permitted under the Virginia Stormwater Management Program (VSMP). This load was formulated based on the entire watershed area. However, it should be noted that the Virginia Department of Conservation and Recreation is only considering construction sites that discharge directly to the impaired stream segment through the VSMP General Permit when ensuring that these sites will not result in the exceedence of the WLA for permitted land disturbance. This means that the WLA for VSMP permitted sites that was intended for the entire watershed will be applied to a considerably smaller drainage area (only the acreage downstream of the dam that drains directly to the impaired segment). The result will most probably be detrimental to the impaired segment, making it extraordinarily difficult to remove the aquatic life impairment. Consequently, the WLA should be reduced through an area adjustment based on the ratio of the area draining directly to the impaired segment and the entire TMDL watershed area. The formulation and enforcement of the VSMP WLA should be a joint effort between the Virginia Department of Conservation and Recreation and the Virginia Department of Environmental Quality.

*DEQ Response: A TMDL is a watershed-based pollutant study which branches out from an impaired segment to the land area impacting that segment. All point and nonpoint sources of the pollutant of concern are identified and quantified. Some large TMDLs contain boundary conditions where the upstream extent of a watershed is not considered in the development of a TMDL; however, that is not the case for the Little Calfpasture. All sources of the pollutant of concern, sediment, are considered in the entire watershed. To constrain the impacts of VSMP permits to the impaired segment is to ignore the significant impact of upstream sources of the pollutant, whether from construction stormwater, industrial stormwater or even pastureland. In addition, federal statute / regulations require that all permitted point sources under the areal extent of the TMDL that discharge the TMDL pollutant be identified in the TMDL and given a TMDL WLA. It is hoped that DEQ and DCR can come to an agreement and develop guidance on this issue.*

**Comments provided by Charles J. Whittle, Jr.**

Thank you for the opportunity to comment on the draft TMDL report prepared recently by DEQ. I want to ensure that this report do all that is legally possible and required to address the long term problems of pollution of the Little Calfpasture River and the Maury River into which it flows.

*DEQ Response: Thank you for commenting on the Little Calfpasture River TMDL.*

The Maury River through Goshen Pass has properly been included in the Nationwide River Inventory because of its exceptional qualities. I float fish and canoe the Maury River through out the year and it is one my favorite rivers. I am also active in New River cleanup efforts but that is not the topic here.

*DEQ Response: The Maury River and Goshen Pass are certainly treasure of the Commonwealth. It is hoped that by improving the Little Calfpasture, the Maury will also be improved. The TMDL study and report lay the foundation for that improvement effort. Thank you for your efforts to improve water quality around Virginia.*

I understand that Lake Merriweather in its current condition is the source of the pollution and siltation in the river. In order to protect the interests of the public who use and value the Maury River, the TMDL should be rewritten.

*DEQ Response: The TMDL document clearly states that “the study found that the ultimate source of the impairment is the presence of Lake Merriweather and the Goshen Dam” (Chapter 1, pg. 1).*

My concerns include:

- There is insufficient actual data used to develop the model on which DEQ relies;

*DEQ Response: DEQ asserts that the level of data used to calibrate the Little Calfpasture River model was adequate and consistent with the level commonly used in EPA-approved TMDLs. As*



*with any TMDL, if newly-collected data suggest inaccuracies that would impact the outcome of the TMDL, the TMDL can always be revised.*

- The combination of model types used in the draft is inappropriate;

*DEQ Response: The Loading Simulation Program C++ (LSPC) watershed model was used to simulate hydrology and sediment in the Little Calfpasture River above and below Lake Merriweather, and the Environmental Fluid Dynamics Computer Code (EFDC) receiving water model was used to simulate hydrology and sediment within Lake Merriweather. Both models were used within their EPA-approved guidelines as included in EPA's TMDL Modeling Toolbox (<http://www.epa.gov/extrmurl/wwgtsc/Toolbox-overview.pdf>).*

- Changing the water quality standard for the degraded stream section is an inappropriate use of the Use Attainability Analysis under the Clean Water Act.

*DEQ Response: DEQ and EPA worked together to formulate the Use Attainability Analysis (UAA), which allows for a 0.74 mile zone of recovery from the dam to the point where the original standard must be met (at Station 2-LCF000.02) and has been approved by the EPA. The purpose of a UAA is to set water quality standards to achievable levels. In fact, EPA's Introduction to UAAs website states "We believe that setting attainable water quality goals is important in stimulating action to improve water quality. We do not believe that setting unattainable uses advances actions to improve water quality" (<http://www.epa.gov/waterscience/standards/uses/uaa/info.htm>).*

- The TMDL document significantly understates the role of Lake Merriweather and its current management in the continuing problem of sediment pollution in these rivers.

*DEQ Response: As stated previously, the TMDL document clearly states that the cause of the problem is Lake Merriweather and the Goshen Dam. This report also emphasizes the importance of a sediment reduction strategy that includes both reductions in sediment sources throughout the watershed, and reductions coming from lake sediment management.*